Question 1: A says "Either I am a knight or B is a knave." If A is a knight, then what can be said about B?

a) B is a knight

b) B is a knave

c) B can be either

d) Contradiction

Question 2: In a class, girls are three times as many as boys, and there are 12 more girls than boys. How many girls are there?

a) 6

b) 12

c) 18

d) 24

Question 3: Given A = B > C = D and F < E = D < A, which of the following is not correct?

a) F < C

b) D > F

c) C = E

d) A < D

Question 4: 2 kg of apples cost Rs. 240. How much will 5 kg cost at the same rate?

a) Rs. 500

b) Rs. 600

c) Rs. 700

d) Rs. 800

Question 5: Michael is John's father. John's wife is Seema. What is Seema to Michael?

a) Daughter

b) Daughter-in-law

c) Granddaughter

d) Aunt

Question 6: Four people must cross a bridge at night with one flashlight; times to cross are 1, 2, 5, 10 minutes. Only two can cross at a time. What is the minimum total time required for all to cross?

a) 15 minutes

b) 17 minutes

c) 18 minutes

d) 20 minutes

Question 7: If $x + y = 7$ and $x^2 + y^2 = 25$, find xy.

a) 5

b) 12

c) 24

d) 14

Question 8: A train 120 m long crosses a 330 m long platform in 30 seconds. What is the speed of the train in km/h?

a) 54 km/h

b) 45 km/h

c) 60 km/h

d) 72 km/h

Question 9: Factorize $9a^2 – 25$.

a) $(3a – 5)^2$

b) $(3a + 5)^2$

c) $(3a – 5)(3a + 5)$

d) $(9a – 25)$

Question 10: Which of the following is a valid logical conclusion? "All roses are flowers. All flowers fade." Which is correct?

a) All roses fade.

b) Some roses fade.

c) No rose fades.

d) Cannot be determined.

Question 11: If $x + 1/x = 5$, find $x^2 + 1/x^2$

a) 25

b) 23

c) 27

d) 21

Question 12: No reptiles are mammals. All snakes are reptiles. Which conclusion is valid?

a) No snakes are mammals.

b) Some snakes are mammals.

c) All snakes are mammals.

d) All mammals are reptiles.

Question 13: A collection of coins consists of 5-rupee and 10-rupee coins. There are 15 coins totalling Rs. 100. How many 5-rupee coins are there?

a) 5

b) 10

c) 15

d) 8

Question 14: Three houses are painted Red, Green, and Blue. A lives in Red, C does not live in Red or Blue. Which colour is C's house?

a) Red

b) Blue

c) Green

d) Cannot be determined

Question 15: In a class of 80, 32 play football, 24 play basketball, and 10 play both. How many students play neither?

a) 10

b) 24

c) 34

d) 46

Question 16: All managers are employees. No employees are contractors. Which statement is true?

a) Some managers are contractors

b) No managers are contractors

c) All contractors are managers

d) None of these

Question 17: Faiz travels to work by car, bus, and train with speed ratio 8:10:5 respectively. If his car's speed increases by 25% and both the bus's and train's speeds decrease by 20%, the total commute time increases by 9 minutes. What was the original speed of the bus (km/h)?

a) 60 km/h

b) 40 km/h

c) 50 km/h

d) 45 km/h

Question 18: In a club, 60 people play football, 50 play cricket, and 20 play both. How many play either football or cricket?

a) 90

b) 80

c) 70

d) 100

Question 19: A student scored 18 out of 20 marks in an exam. What percentage did he score?

a) 85%

b) 90%

c) 95%

d) 100%

Question 20: You have 8 coins, one of which is slightly heavier. Using a balance scale only, what is the minimum number of weighings needed to guarantee finding the heavier coin?

a) 2

b) 3

c) 4

d) 5

Question 21: Peter can do a job in 12 days and Rahul in 18 days. Working together, how many days will they take?

a) 6 days

b) 7.2 days

c) 7 days

d) 8 days

Question 22: The principal of Rs. 1000 is lent at 5% simple interest per year. What is the interest earned in 2 years?

a) Rs. 100

b) Rs. 150

c) Rs. 200

d) Rs. 250

Question 23: "All artists are creative. Some scientists are artists." Which conclusion follows?

a) Some scientists are creative.

b) All scientists are creative.

c) No scientists are creative.

d) All creative people are scientists.

Question 24: Statement: G = Y < U ≤ F > P > T < V. Conclusions:

I. F > G.

II. F > T. Which is true?

a) Only conclusion I is true.

b) Only conclusion II is true.

c) Both conclusions I and II are true.

d) Neither conclusion is true.

Question 25: In a truth-liar puzzle, Person A says "We are all liars." Who is telling the truth?

a) A truth-teller

b) A liar

c) Either

d) Cannot be determined

Question 26: A shopkeeper buys an article for Rs. 360 and sells it for Rs. 450. What is the profit percent?

a) 20%

b) 25%

c) 15%

d) 30%

Question 27: A car travels 150 km at a steady speed of 50 km/h. How long will the journey take?

a) 2 hours

b) 3 hours

c) 2.5 hours

d) 1.5 hours

Question 28: Which is the correct expansion of $(a + b)^3$?

a) $a^3 + b^3$

b) $a^3 + 3a^2b + 3ab^2 + b^3$

c) $(a + b)(a^2 + b^2)$

d) None of these

Question 29: If 3/5 of a number is 12, what is the number?

a) 20

b) 15

c) 10

d) 25

Question 30: Which of these is always true about real numbers x and -x?

a) $x + (-x) = 0$

b) $x + (-x) = 2x$

c) $x \times (-x) = 0$

d) $x/(-x) = 0$ (if $x \neq 0$)

Question 31: Simplify $(x – 4)(x + 4)$.

a) $x^2 – 16$

b) $x^2 + 16$

c) $x^2 – 4x + 4$

d) $x^2 + 4$

Question 32: Find the sum of angles in a triangle (in degrees).

a) 180

b) 90

c) 270

d) 360

Question 33: Which of the following is not a perfect square?

a) 64

b) 81

c) 45

d) 100

Question 34: Which number continues the sequence: 2, 4, 8, 16, …?

a) 24

b) 32

c) 48

d) 64

Question 35: 10% of 200 is?

a) 20

b) 10

c) 30

d) 25

Question 36: If r_1 and r_2 are the roots of $x^2 − 5x + 6 = 0$, what is $1/r_1 + 1/r_2$?

a) 5/6

b) 6/5

c) 5

d) 1/6

Question 37: A six-sided die is rolled 60 times with observed frequencies: 1→10, 2→12, 3→8, 4→10, 5→9, 6→11. Which face occurred most often?

a) 1

b) 2

c) 6

d) 5

Question 38: Which technique would you use to solve $x^2 + 7x + 10 = 0$?

a) Factorize

b) Quadratic formula

c) Complete the square

d) Graphing

Question 39: What is the greatest common divisor (GCD) of 18 and 24?

a) 6

b) 3

c) 12

d) 9

Question 40: Solve for x: $2^x = 32$.

a) 4

b) 5

c) 6

d) 3

Question 41: All cats are mammals. All mammals have hearts. Which conclusion is correct?

a) All cats have hearts.

b) Some cats have hearts.

c) No cat has a heart.

d) Cannot be determined.

Question 42: If f(x) = 3x + 2, what is f (3)?

a) 9

b) 11

c) 12

d) 8

Question 43: Which of the following numbers is irrational?

a) $\sqrt{2}$

b) 9/3

c) 0.25

d) 4

Question 44: John is the brother of Mary, and Mary is the mother of Lisa. What is John to Lisa?

a) Father

b) Brother

c) Uncle

d) Cousin

Question 45: Find the least common multiple (LCM) of 6 and 15.

a) 30

b) 45

c) 90

d) 60

Question 46: What is 0.5 + 0.25 as a simplified fraction?

a) 3/5

b) 3/4

c) 4/5

d) 5/6

Question 47: The equation $x^2 + 1 = 0$ has how many real roots?

a) 0

b) 1

c) 2

d) Infinite

Question 48: If x + y = 1 and x*y = 2, what is $x^3 + y^3$?

a) 5

b) –5

c) 7

d) –7

Question 49: 25% of 180 is?

a) 25

b) 30

c) 45

d) 60

Question 50: If P is the mother of Q, and R is Q's brother, then R is to P:

a) Brother

b) Son

c) Uncle

d) Nephew

Question 51: 8% of 50 is?

a) 4

b) 40

c) 0.4

d) 8

Question 52: What is sin (90°)?

a) 0

b) 1/2

c) 1

d) √2/2

Question 53: In a triangle, the sum of interior angles is always ___ degrees.

a) 90

b) 180

c) 270

d) 360

Question 54: If f(x) = 2x + 3, what is f (4)?

a) 8

b) 10

c) 11

d) 12

Question 55: If the arithmetic mean of five numbers is 12 and four of them sum to 44, what is the fifth number?

a) 12

b) 16

c) 20

d) 8

Question 56 Simplify: $(x^3 - y^3)/(x - y)$.

a) $x^2 + xy + y^2$

b) $x^2 - xy + y^2$

c) $x^2 + y^2$

d) $x + y$

Question 57: What is the median of the data set {2, 3, 7, 8, 12}?

a) 3

b) 7

c) 8

d) 5

Question 58: Which number is a simple counterexample to the (false) statement "All prime numbers are odd"?

a) 2

b) 3

c) 5

d) 7

Question 59: What is the next term in the arithmetic sequence 5, 9, 13, ... ?

a) 15

b) 16

c) 17

d) 18

Question 60: Which of these is a prime number?

a) 57

b) 59

c) 63

d) 65

ROUGH WORK
(NOT TO BE EVALUATED)

DATE